

FLIGHT

The
AIRCRAFT
ENGINEER
and
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

1923

Feb. 1	.....	Lecture, "Ten Years' Testing of Model Sea-planes," by G. S. Baker, before R.Ae.S.
Feb. 6-7	.....	Third Air Conference at the Guildhall
Feb. 9	.....	Lecture, "Seaplane Design," by W. O. Manning, before I.Ae.E.
Feb. 15	.....	Lecture, "The Practical Aspects of the Seaplane," by Wing-Commander Cave-Brown-Cave, before R.Ae.S.
Feb. 23	.....	Lecture, "Aerofoils," by Dr. A. P. Thurston, before I.Ae.E.
Mar. 1	.....	Lecture, "Helicopters," by Major F. M. Green, before R.Ae.S.
Mar. 1	.....	Entries close for the Schneider Cup
Mar. 15	.....	Entries close for Dutch Height Indicator Competition.
Mar. 15	.....	Lecture, "The Control of Aeroplanes at Slow Speeds," by Professor B. Melville Jones, before R.Ae.S.
Mar. 17	.....	Entries close for Gordon Bennett Balloon Race
Apr. 12	.....	Lecture, "Some Controversial Points in Aircraft Design," by F. T. Hill, before I.Ae.E.
May 11	.....	Lecture, "Experimental Flying," by Maj. M. E. A. Wright, before I.Ae.E.
June 25-30	.....	International Air Congress, London
June 30	.....	R.A.F. Aerial Pageant
July	.....	Air Race for King's Cup
July 20	.....	Gothenburg Exhibition

EDITORIAL COMMENT.



ON Tuesday of next week (February 6), the Lord Mayor will open, at the Council Chamber of the Guildhall, the third Air Conference, called by the Air Ministry to provide an opportunity for the examination and discussion, by representative members of all sections of the community, of the problems associated with the development of air transport. As was the case last year, the Conference will last two days, the first of which will be devoted to the reading during the morning session of papers, dealing mainly with air transport problems, and during the afternoon session papers will be read which are chiefly of a technical nature. A list of these is given elsewhere in this issue. The second day of the Conference will be devoted to a discussion of the papers read during the first day. On Monday, February 5, there will be a visit to the Croydon aerodrome, and those who choose to stay at the aerodrome sufficiently late will have an opportunity of witnessing the beginning of the night-flying experiments which are to be carried out on the London-Paris route for a few weeks.

The Conference should assist materially towards bringing together those manufacturing and operating aircraft, on the one hand, and representative members of the sections of the community likely to be potential users of air transport, on the other. With reference to the papers to be read, we are glad to see that, judging by their titles, controversial subjects have been kept out as far as possible.

At last year's Conference, we commented on the way in which various speakers took up conflicting views, with the result that the discussions resolved themselves into questions of detail, such as wood *versus* metal, thick wings *versus* thin wings, single engines *versus* multi-engines, etc., problems for the discussion of which the Royal Aeronautical Society is the proper place, but not an Air Conference. Let it be remembered that the object of the Conference is to afford those connected with aviation an opportunity of pointing out to potential users of air transport the advantages which this has to offer. That is not done usefully by giving the outside world

the impression that we disagree among ourselves, and do not appear at all clear as to what we can or cannot do. The papers to be read this year do not appear likely to produce this form of discussion.

We are glad to find that a very serious omission in last year's programme is to be repaired this year. We refer to the subject of seaplanes. Mr. C. R. Fairey, Chairman of the S.B.A.C. and Managing Director of the Fairey Aviation Co., is reading a paper on this subject, and as Mr. Fairey has had extensive experience of seaplane design, construction and operation, dating back to the early days of flying, when he was associated with Messrs. Short Brothers, he is well qualified to speak upon this subject.

Commander Burney will read a paper on "A Self-supporting Airship Service," and will, no doubt, place before the public details of his scheme in its latest form. Now that it is definitely known that the Admiralty are favourably disposed, and that it is mainly a question of Treasury red tape (the excuse apparently being that it is against the accepted practice for a Government Department to have direct dealings with a commercial organisation), it may be hoped that the long-delayed scheme will go through, and that after three years' "We will, we won't, we will," a service will come into being.

With regard to the reported attitude of the Treasury, we are entirely at variance with it, and not only so, but we fail to see why "direct dealings" should be worse in the case of airships than they are in the case of subsidised liners. Yet steamship lines are being subsidised, and nobody thinks anything of it. Then why not airships?

Colonel Alec Ogilvie's paper on gliders deals with a subject which is very much to the fore at the

moment, and is, therefore, to be welcomed, more especially as it treats the subject from the point of view of the value of gliding to aeronautical progress, rather than from the sporting point of view.

General Sir Sefton Brancker will deal with "The Position of Air Transport Today," and Air Vice-Marshal Sir W. G. H. Salmond with "The Progress of Research and Experiment." All the papers should provide very valuable material, and doubtless the ensuing discussions will also add to our knowledge of and interest in aviation matters.

• • •

London- Prague- Budapest

The announcement that an agreement has been reached between the British and Czecho-Slovak Governments for the establishment of a regular air service over the London-Cologne-Prague-Budapest route will be welcomed by all who believe that only over long distances can air services be made full use of and come within measurable distance of paying their way. Not only so, but the line contemplated is on the direct route to the East, and once the present unsettled state of Europe is a thing of the past, there is little doubt that the overland route will prove the quickest. At present, it would appear that Germany will have to be consulted in the matter, but there is every reason to hope and believe that no very great difficulty need be expected from this source. Already on the London-Prague section the saving in time will be tremendous—something like 9 hours as against 36 hours by ordinary train and steamer service. Thus, the London morning newspapers should reach Prague by about 6 p.m., while in the case of passengers and goods, a similar saving in time will be possible.

□ □ □ □

The Duke of Sutherland on Air Problems

SPEAKING on the subject of "Air Problems" at a dinner at the Authors' Club, on January 29, the Duke of Sutherland, Under-Secretary of State for Air, who was the guest of honour, showed that he has a thorough grasp of the essential problems with which aviation is faced, and incidentally he proved himself no mean judge of psychology by stating that "it is far better for the world at large to view the flight of man through spectacles of romance and excitement, rather than through the prosaic vision of an aeroplane constructor or air transport company director." Concerning air transport, His Grace emphasised the fact that a line running from Glasgow to Prague, via London and Paris, would pay very much better than a line running from London to Paris only.

Referring to civil and military aviation, the Duke of Sutherland said we should never lose sight of the fact that these two are not in any way opposed to one another, but that civil aviation is to military aviation what the mercantile marine is to the Navy. Touching upon the manner in which France encourages aviation, His Grace mentioned that France is spending very much more on both military and civil aviation than are we, and that the immediate result is that the French have very many more fighting squadrons and more commercial air lines than we have. He thought that no doubt they felt that, as Britain had always been considered mistress of the seas, it would not be a bad plan for France to become "Mistress of the Air."

In conclusion, the Under-Secretary of State for Air said that in order to ensure progress the essential thing undoubtedly was to retain a separate Air Ministry, independent of either the Army or Navy, but working amicably and openly with both for the achievement of the supreme task—the adequate defence of our great Empire.

The Third Air Conference Programme

THE following is an outline of the programme of the third Air Conference, which will be opened by the Lord Mayor in the Council Chamber of the Guildhall, London, on

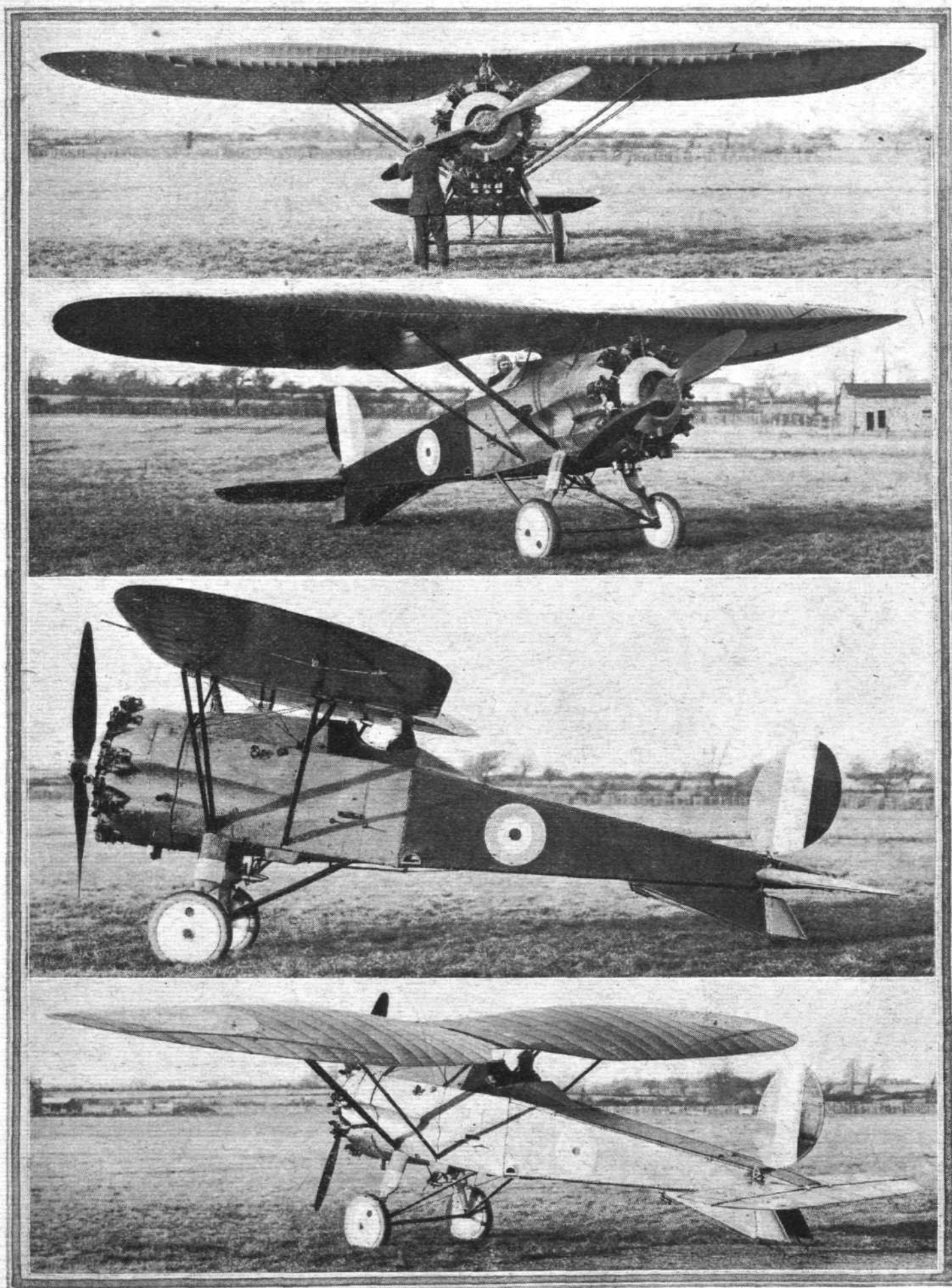
February 6. On the preceding day, February 5, a visit will be made to the London Terminal Aerodrome, Croydon, so that members of the Conference can see in advance the organisation of a fully-equipped civil aerodrome and the methods adopted in operating British commercial air services. The Conference will be divided into four sessions, each of which will be presided over by the following chairmen respectively:—Lieut.-Col. the Rt. Hon. Sir Samuel Hoare, Bt., C.M.G., M.P., Secretary of State for Air; the Duke of Sutherland, Under-Secretary of State for Air; Sir Henry P. Maybury, K.C.M.G., C.B., Director-General of Roads, Ministry of Transport; and Sir William Joynson-Hicks, Bt., M.P., Parliamentary Secretary, Overseas Trade Department.

At the first session on the 6th, which is primarily concerned with air transport, papers will be read by Maj.-Gen. Sir W. S. Brancker, K.C.B., A.F.C., on "The Position of Air Transport Today," and by Commander C. D. Burney, C.M.G., M.P., on "A Self-supporting Airship Service."

The second session, which takes place on the first afternoon, will be devoted to addresses, which are mainly of a technical nature, the speakers being Air Vice-Marshal Sir W. G. H. Salmond, K.C.M.G., C.B., D.S.O., Air Member for Supply and Research on the Air Council, on "The Progress of Research and Experiment"; Colonel Alec Ogilvie, C.B.E., on "Gliders and their Value to Aeronautical Progress"; and Mr. C. R. Fairey, M.B.E., Chairman of the Society of British Aircraft Constructors, on "Seaplanes."

The two sessions on the second day have been allocated to a consideration of the papers read on the previous day, when interesting views and suggestions are expected to be put forward.

The night-flying tests on the London-Paris route, which will be carried out by the Air Ministry for about a month, will commence from Croydon aerodrome on February 5, and representatives to the Conference are also being given an opportunity to witness the departure of the first machine, which is timed to take place at 6.30 p.m.



A NEW "BRISTOL" MACHINE : These photographs of the Bristol "Bullfinch," with Bristol "Jupiter" engine, are passed for publication by the Air Ministry, but no information beyond what can be gleaned from an inspection of the illustrations is permitted.



THE PARIS AERO SHOW 1922

By THE TECHNICAL EDITOR

(Concluded from page 50)

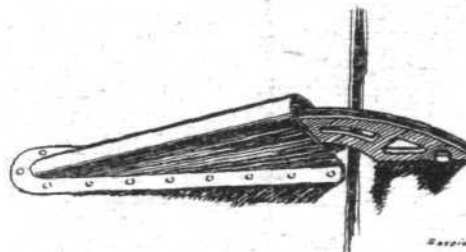
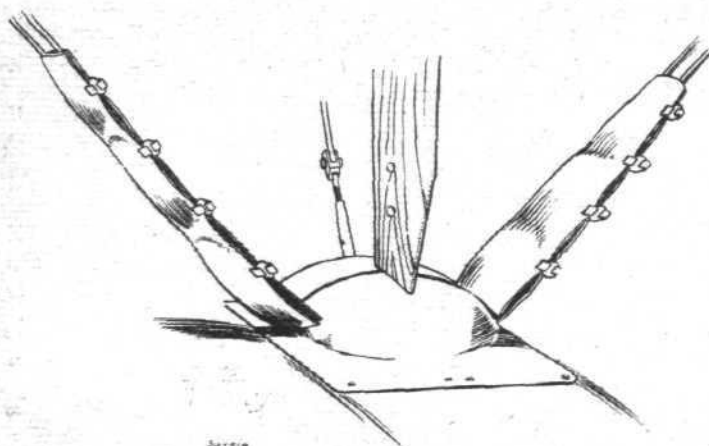
SOCIETA IDROVOLANTI ALTA ITALIA ("Savoia"), Sesto Calende.

ONE of the latest flying boats to be produced by the SIAI firm of Sesto Calende, Lake Maggiore, Italy, is the Savoia S.53. Fitted with a 300 h.p. Fiat engine, this machine is a commercial flying boat in which, however, no attempt

northern climates, and, this being the case, there is no doubt that open cockpits, if provided with adequate wind-screens, afford the passengers a much greater sense of movement and freedom than would be the case if they were housed in a closed saloon.

As regards the machine itself, the S.53 follows usual Savoia practice, having a flat-sided hull and a single hollow step. The workmanship is, as usual, excellent, and altogether the machine makes a very favourable impression.

The only unusual feature is the arrangement of the passenger accommodation. One passenger sits in front, on the starboard side, and behind his cockpit, one behind the other, are the two cockpits for the passengers and pilot (the latter



The rudder crank on the Savoia is working partly inside a fairing.

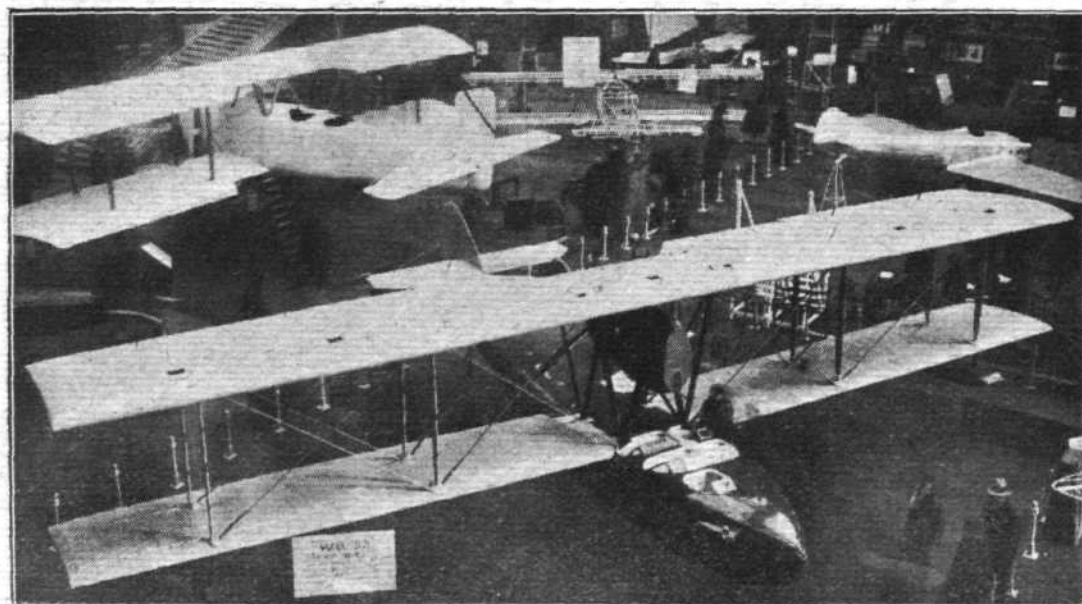
ON THE SAVOIA FLYING BOAT: The wire strainers are enclosed in aluminium fairings.

has been made to include in the design a cabin for the passengers. Nor are we certain that for a flying boat a cabin is essential. It must be remembered that the Savoia will mostly work in a southern climate and under pleasant conditions, entirely different from the rains and fogs of more

on port side in second cockpit). These are so arranged as to be divided longitudinally by a stout structural member, two passengers in each cockpit sitting on the starboard side of this, and one on the port side. Evidently the longitudinal member has been incorporated in order to strengthen the hull at a place where otherwise the cutting out of the cockpit openings would weaken the structure.

The Fiat engine is mounted on engine struts high in the

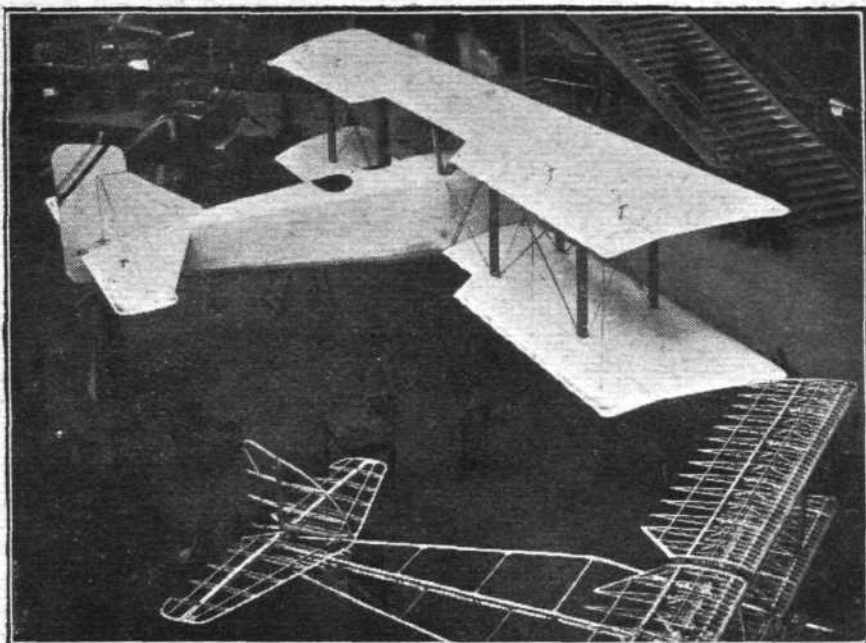
The Savoia Flying Boat: Of the S.53 type, this Savoia carries pilot and six passengers. The engine is a 300 h.p. Fiat.



gap, and drives a pusher airscrew. The radiator is in the nose of the engine nacelle, and a starting handle projects through it in a position easily accessible from the aft cockpit. Following are the main characteristics of the Savoia 53: Engine, 300 h.p., Fiat type, A12 bis; wing area, 65 sq. m. (700 sq. ft.); weight of machine, empty, 1,750 kg. (3,850 lbs.); fuel and useful load, 800 kg. (1,760 lbs.); total loaded weight, 2,550 kg. (5,610 lbs.); power loading, 18.7 lbs./h.p.; wing loading, 8 lbs./sq. ft.; maximum speed, 160 km. (100 m.p.h.); min. speed, 80 km. (50 m.p.h.); power expenditure, 50 h.p. per passenger.

SOCIETE D'EMBOUTISSAGE ET DE CONSTRUCTIONS MECANIQUES, Colombes (Seine)

It is an unfortunate fact that gradually French aircraft firms are acquiring titles so long that it becomes quite impossible to refer to their products by the full title of the firm, with the result that half of the modern French machines are always identified by a series of initial letters. Thus we have CAMS, SCIM, SIMB and SECM. A certain loss of individuality is the inevitable result. Thus when referring to a Farman, or a Blériot, or a Hanriot, the personality of the chief of the firm always comes to mind. A series of initial letters entirely fail to give to the products of a firm that personal touch, and except by using considerable care confusion is likely to result. One of the firms whose machines are



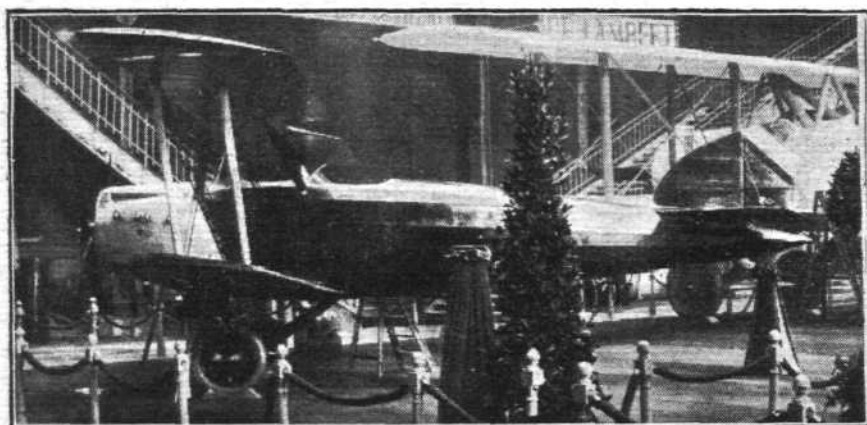
THE S.E.C.M. NIGHT-BOMBER: The engine is a Salmson.

single-engined night bomber with Salmson engine, and the other two touring or school machines with Hispano engines.

The S.E.C.M. B.N.2 is a two-seater with very large fuselage.

The machine is built of metal throughout, except for the covering, which is fabric. The engine, a 500 h.p. Salmson (or so it is stated), is mounted in the nose, and is cooled by two side radiators. Externally, the machine shows little originality, and as it was entirely covered in, it was not possible to ascertain its constructional details, except to learn that the whole structure is of metal (steel and Duralumin). The wing area is 72 sq. m. (775 sq. ft.), and the useful load 1,000 kg. (2,200 lbs.). The maximum speed at 2,000 m. is 180 km. (112 m.p.h.), and the ceiling 5,000 m. (16,400 ft.). Sufficient petrol can be carried for a flight of 800 km. (500 miles).

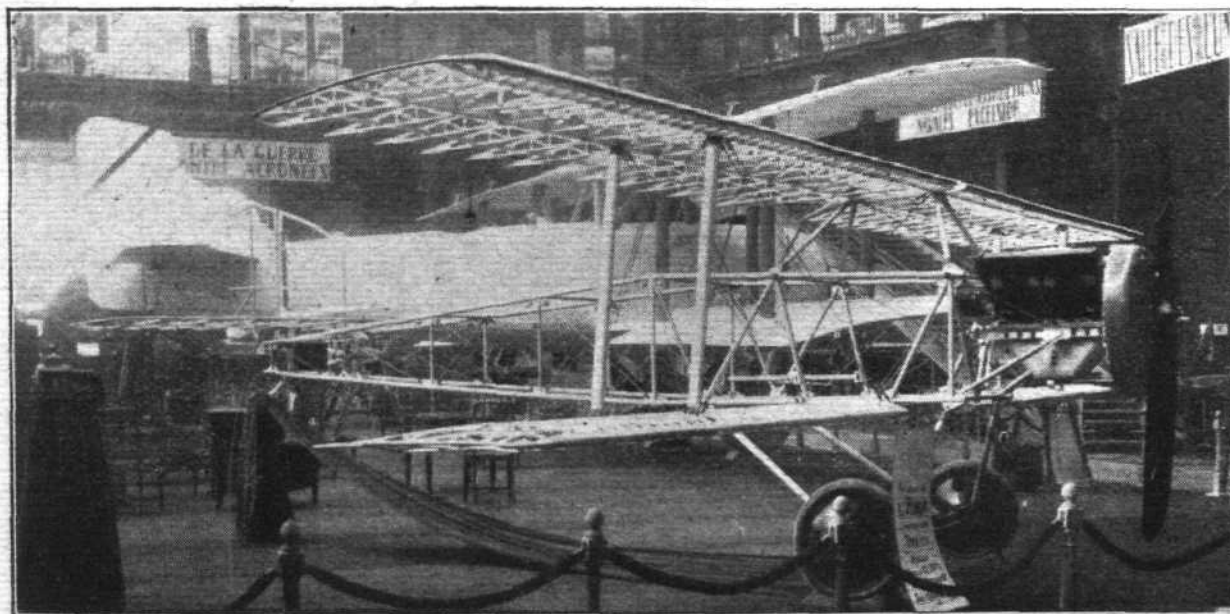
The S.E.C.M. type XXIII is intended for touring, and in general arrangement is similar to the new Bristol three-seater, although it is a much larger machine. The pilot sits in front, between the wings, and the passengers' seats are placed behind the wings, side by side. The machine is built of metal throughout, excepting the covering, and the engine is a 180 h.p. Hispano-Suiza run normally at 160 h.p. Thus, the engine is considerably more powerful than that of the Bristol, which has a 100 h.p. Lucifer. The wing area is 26 sq. m.



THE S.E.C.M. TOURER: This is a three-seater with Hispano engine.

identified by initial letters is the Société d'Emboutissage et de Constructions Mécaniques, otherwise S.E.C.M. Three machines were exhibited by this firm, one of which was a

180 h.p. Hispano-Suiza run normally at 160 h.p. Thus, the engine is considerably more powerful than that of the Bristol, which has a 100 h.p. Lucifer. The wing area is 26 sq. m.



The S.E.C.M. type XXII: This machine is built entirely of metal, mostly Duralumin.

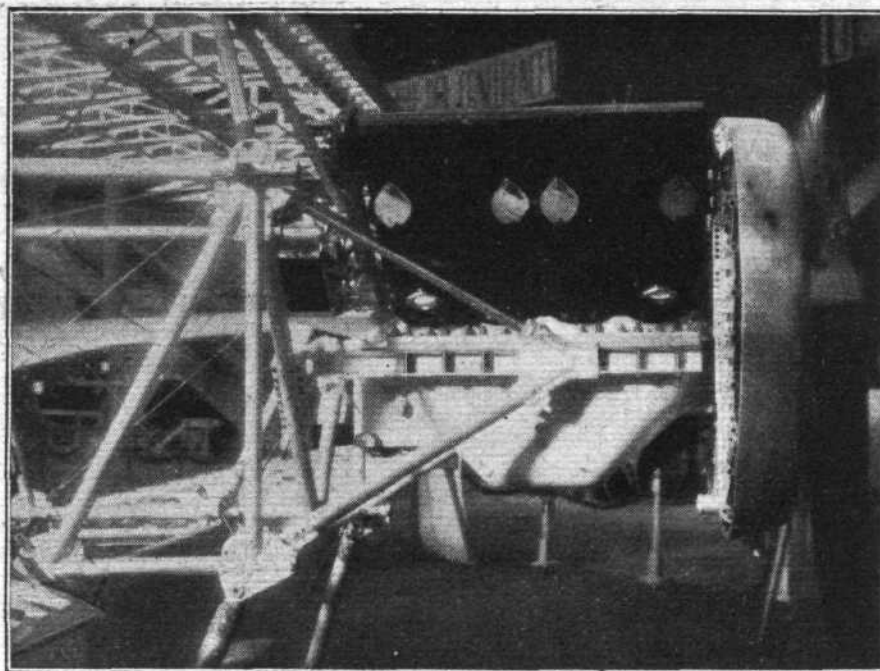
(280 sq. ft.), and the speed range 180 km. (112 m.p.h.) to 60 km. (37 m.p.h.).

The third machine exhibited, a touring and school type side-by-side two-seater, was shown in skeleton, and consequently was by far the most interesting, as the details of the metal construction could be thoroughly examined. Consequently this type, the XXII, will be dealt with at greater length, keeping in mind that many of the constructional features are common to all three machines.

The fuselage of the S.E.C.M. XXII is constructed entirely of Duralumin tubes, joined together by very elaborate sheet Duralumin fittings wrapped around the longerons and struts. The details are shown in the accompanying sketches. Riveting is everywhere employed for joining two pieces of metal, or the edges of a folded piece, but it would appear at any rate possible that a certain amount of unscientific design is found in the manner in which the sockets terminate on struts and longerons. We believe we are correct in stating that several British constructors have found that where a tube end is housed in a socket there is likelihood of the tube cracking just at the edge of the socket, unless this is thinned down to a feather-edge. This precaution does not appear to have been taken in the S.E.C.M. machine, and it is possible that trouble will arise out of this omission. The workmanship of the fitting, as indeed of the whole of the construction, is excellent, and it is claimed that the makers have discovered a method of rendering the metal immune from corrosion.

The wing construction is, if anything, neater than that of the fuselage, and is considerably "cleaner" than on the majority of the all-metal machines. To a certain extent this is due to the fact that the spars are merely rectangular section Duralumin tubes, so that no lattice work, riveting, etc., is required. Whether such a tube is very economical is another matter, but its use certainly makes for simplicity.

The ribs are of U-section, but the edges are pinched together so that the actual rib flanges almost become tubes, open on one side and having projecting flanges. The vertical web struts and diagonal ties are stamped from the flat sheet,

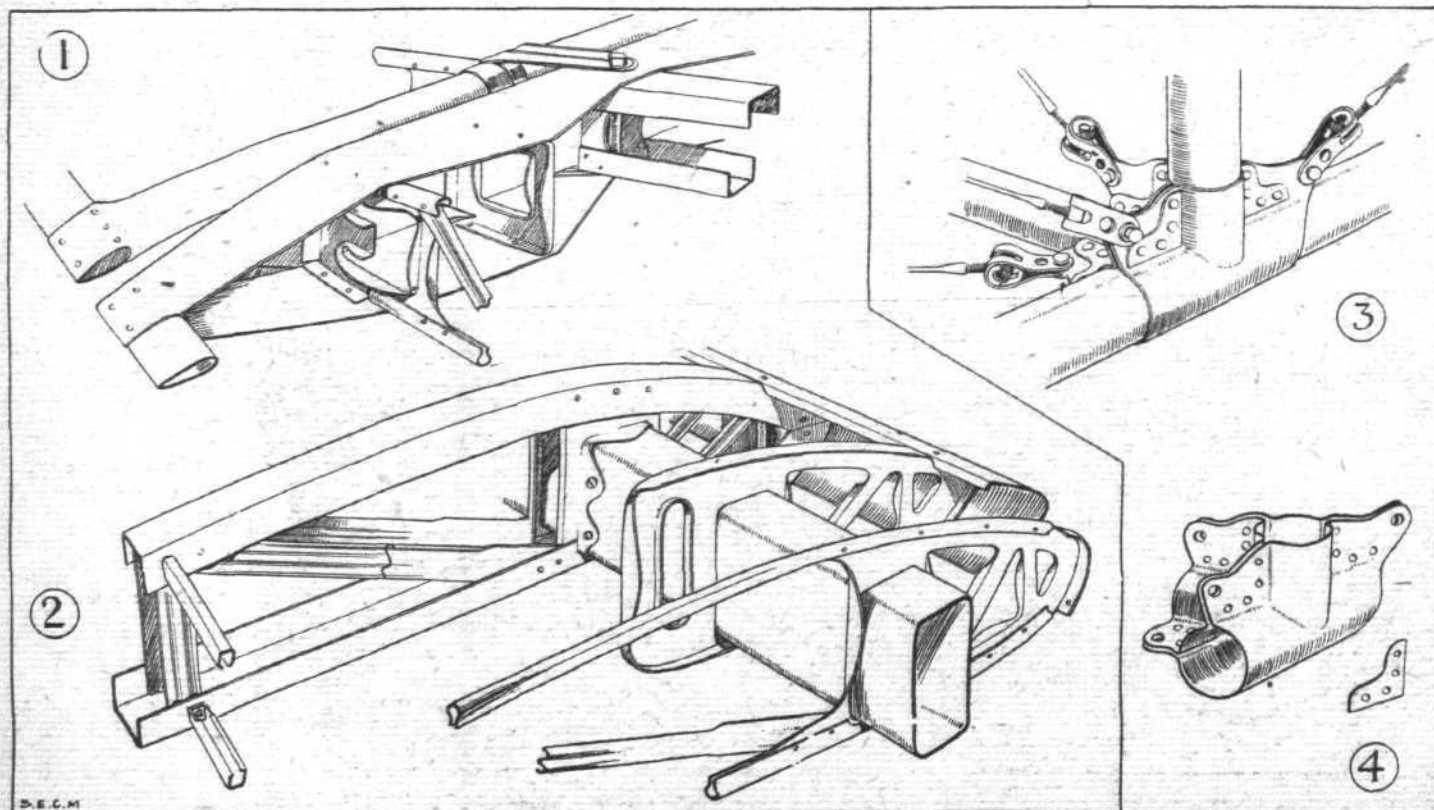


THE S.E.C.M. type XXII : View showing simple engine mounting.

and are given three corrugations, as indicated in one of the accompanying sketches. In between the main ribs are short nose ribs, also stamped from sheet, and having the edges turned over to form channel sections.

As the rear spars are placed relatively far forward in the wing section, in order, no doubt, to retain a spar of reasonable depth, the ailerons are hinged to a false rear spar of channel section. The details of this spar are shown in the top left-hand sketch. The ailerons themselves are of a construction similar to that of the main ribs, with a tubular leading edge, a wire trailing edge, and a channel section stringer running parallel to the spars approximately midway in the aileron chord. The strutting and bracing of the wings are of usual type.

The Hispano engine is mounted on a very simple framework



SOME S.E.C.M. CONSTRUCTIONAL DETAILS : 1 shows aileron hinge and outer end of trailing portion of fixed plane. In 2 is illustrated the general wing construction. The spars are square-section Duralumin tubes, while the rib webs are stamped from the sheet and the flanges are rolled to a bottle-neck U-section. A typical fuselage joint is illustrated in 3, while 4 shows the sheet-Duralumin fitting with the struts removed. The workmanship is excellent, but the fittings appear somewhat complicated.

in the nose, and carries a nose radiator with shutters of normal type. An undercarriage of the usual V-type, sprung by rubber shock absorbers, completes the structure. The tail surfaces are of similar construction to that of the main planes, and in shape are quite orthodox.

The use of all-metal construction in a machine intended for school work is probably a novelty, but although repairs might be somewhat difficult to effect, the rough usage of a machine employed for school purposes should very quickly show up any defects that might exist, and thus assist in perfecting the design in a shorter time than would be possible in a machine used very gingerly.

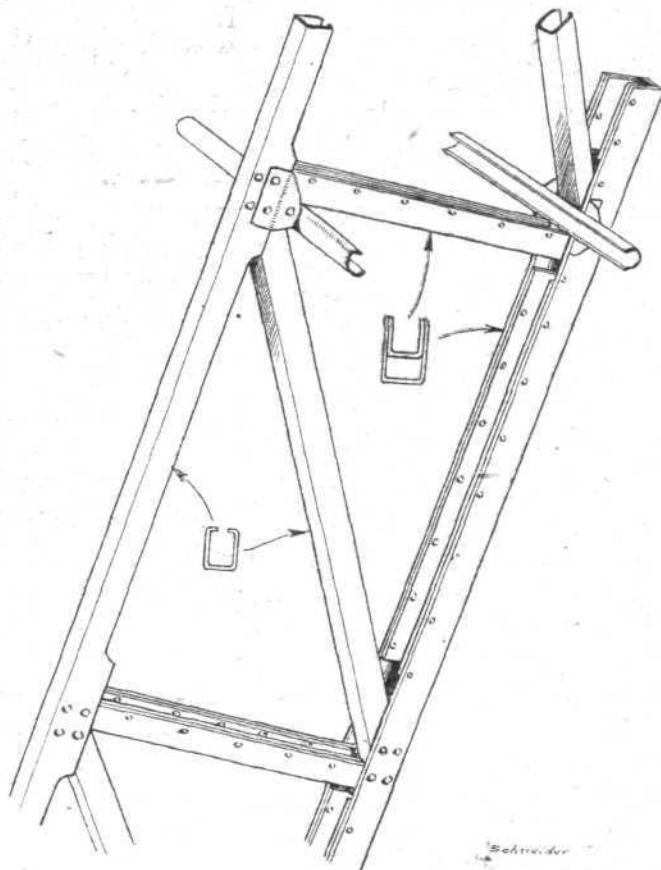
The main characteristics of the S.E.C.M. XXII are as follows:—Length, o.a., 6.9 m. (22 ft. 8 ins.); span, 9.5 m. (31 ft. 2 ins.); wing area 22 sq. m. (237 sq. ft.); total loaded weight 820 kg. (1,805 lbs.); wing loading 8 lbs./sq. ft.; power loading (on full power), 12.7 lbs./h.p.; engine 150 h.p. Hispano, run normally at 130 h.p.; estimated speed at 2,000 m., 180 km. (112 m.p.h.); landing speed, 60 km. (37 m.p.h.).

ETABLISSEMENTS SCHNEIDER, Paris, Harfleur, etc.

It might have been expected that a firm like Schneider et Cie., the famous French armament firm of Creusot and numerous other places, having turned their attention to aircraft construction, would produce something out of the ordinary, and in a sense they have. But considering the almost unlimited resources of the firm, the machine exhibited at Paris can only be described as disappointing. Considering that enormous works are at the disposal of the firm, that metal of any kind and in any form and quantity must have been available, and that the question of cost probably did not enter into the matter, or, at any rate, to a very small extent only, one was justified in expecting something worth while when it was first announced that the Schneider establishment were going to exhibit at Paris. The realisation was, in this case, certainly far short of the anticipation. Not only was the machine shown of antiquated design, but the methods of metal construction employed were those with which most other constructors, French, German and English, were experimenting round about 1916 or 1917. Thus, the arrangement of engines in tandem on the wings was long ago found inefficient, and with the high-power engines now available, it has become entirely unnecessary. Constructionally, the Schneider designers have used, mainly, the Zeppelin type of construction, slightly modified, but in principle very similar to airship frameworks, with channel section spar flanges tied together by lattice bars. Although working well on airship hulls, this form of metal construction has long ago been discarded by aircraft constructors as being uneconomical.

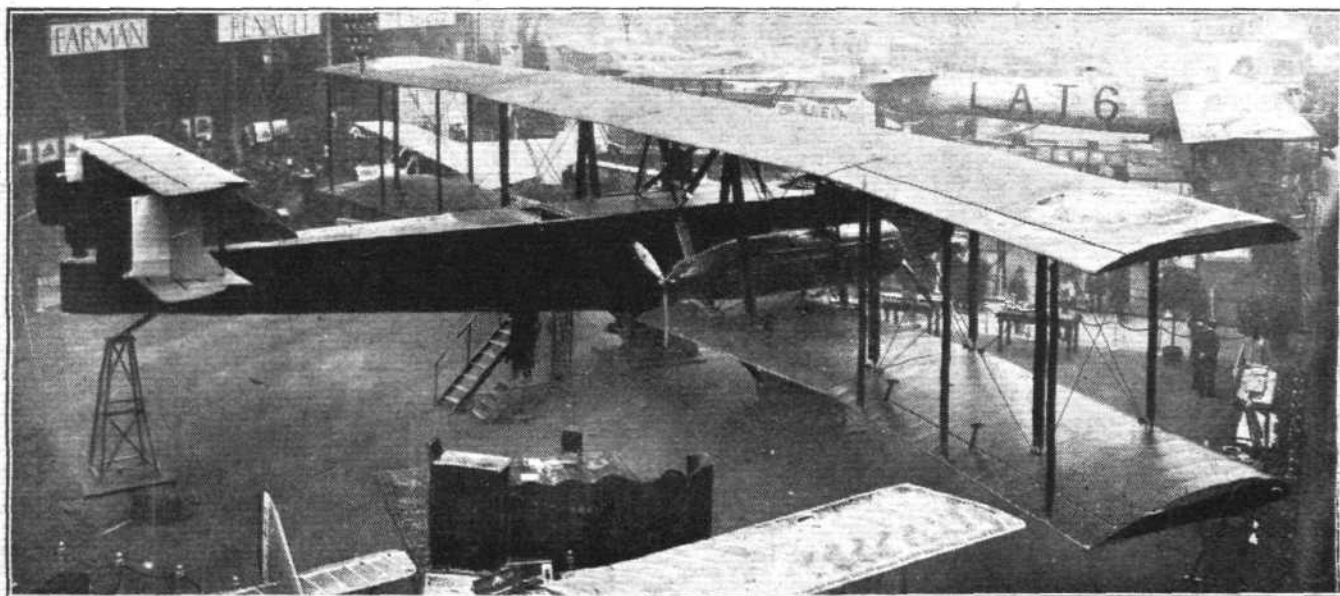
Fundamentally, the Schneider "Henri-Paul," so named

probably so as to make up for the placing of the rear engines fairly far back over the trailing edge. The fuselage is of rectangular section, with flat top, and gunners' nests are provided both in front of and behind the wings.



THE SCHNEIDER "HENRI-PAUL": Details of rib construction. The flanges and ties are of channel section, while the stringers are of U-section, with the edges slightly bent together.

As regards construction, the main principles have already been indicated. A wing skeleton was shown on the stand, and from this the details were ascertained. The spars of high-tensile steel, have flanges of channel section, to which are riveted the lattice bars. The latter are of a shape similar to that of the Zeppelin lattices, but the material is chrome-



THE SCHNEIDER "HENRI PAUL": A four-engined bomber of antiquated design, but built entirely of metal.

after a son of one of the Schneiders killed in the War, is a four-engined biplane night-bomber, with 370 h.p. Lorraine-Dietrich engines. As will be seen from the accompanying photograph, the machine looks like a cross between the Gotha bombers and the Handley Page V-1500. The wings, or rather the outer portion of them, are swept back considerably,

nickel steel. The formation of the lattice bars also differs from that used in the Zeppelins in that, whereas in the latter the lattices formed a series of "X's," they form, in the spars of the Schneider, a series of "N's," i.e., every other lattice is vertical. The drag bracing consists of compression struts in the form of aluminium alloy tubes, and of piano wire

bracing with turnbuckles. The ribs are of aluminium alloy, and are mainly built-up of channel sections. Light longitudinal stringers run parallel with the spars, and steady the ribs between supports. The wing covering is fabric. The inter-plane struts are in the form of steel tubes, with aluminium fairings.

The fuselage is of tubular construction, with longerons of steel and struts of aluminium alloy. The bracing is piano wire, and the covering fabric, with the exception of the front portion, where aluminium alloy is used.

A biplane tail is fitted, each plane of which carries an elevator. There are three rudders, of which the central one is used for course setting when one of the engines stops. A triangular fin is placed ahead of the central rudder.

The undercarriage is of the four-wheeled type, and is only remarkable for the shock-absorbing arrangement, which is somewhat unusual. Each undercarriage incorporates at the lower ends of the struts a form of skid or longitudinal member. The wheel axle carries two longitudinal cantilever beams, free to swivel on the axle, and from these shock absorbers run to transverse bolts on the cantilever beams. Thus, each shock absorber can, if necessary, be removed separately, without interfering with the others.

As already mentioned, the engines are mounted tandem-fashion, between the wings. A streamline engine cowl encloses them entirely, and radiators are mounted above the engine nacelles. The front engines drive two-bladed screws, while the rear engines are fitted with three-bladers. It is of interest to note that the propellers fitted on the actual machine exhibited are Lumière-Leitner-Watts all-metal adjustable pitch airscrews, which are particularly suitable for this machine, not only because they are made of steel, and therefore in keeping with the rest of the machine, but also because of their adjustable pitch, which enables the best pitch for the rear screws, working in the slipstream from the tractors, to be determined experimentally without requiring several sets of ordinary screws to be made. Also the fact that these airscrews are made both as two-bladers and three-bladers makes their fitting desirable. Not that metal airscrews are not always desirable, but in this case their use would appear to be the only logical one. Six large petrol tanks are mounted in the fuselage, each provided with a jettison valve for rapid emptying in case of emergency.

The main characteristics of the Schneider "Henri-Paul" are as follows:—Length, o.a., 20 m. (65 ft. 6 ins.); span, 30 m. (98 ft. 6 ins.); height, 6.1 m. (20 ft.); chord, 3.8 m. (12 ft. 5 ins.); wing area, 220 sq. m. (2,370 sq. ft.); structure weight, 4,000 kg. (8,800 lbs.); weight of engine units, 2,500 kg. (5,500 lbs.); weight of fuel, 1,700 kg. (3,740 lbs.); useful load, 1,820 kg. (4,000 lbs.); total loaded weight, 10,020 kg. (22,040 lbs.); power loading (four engines of 370 h.p. each), 15 lbs./h.p.; wing loading, 9.3 lbs./sq. ft.; maximum speed near ground, 160 km. (100 m.p.h.); speed at 2,000 m., 150 km. (93 m.p.h.); landing speed, 80 km. (49.6 m.p.h.); climb to 2,000 m., 13 mins.; theoretical ceiling, 5,000 m. (16,400 ft.); radius of action, 750 km. (465 miles).

SOCIETE INDUSTRIELLE DES METAUX ET DU BOIS ("Ferbois"), La Courneuve (Seine)

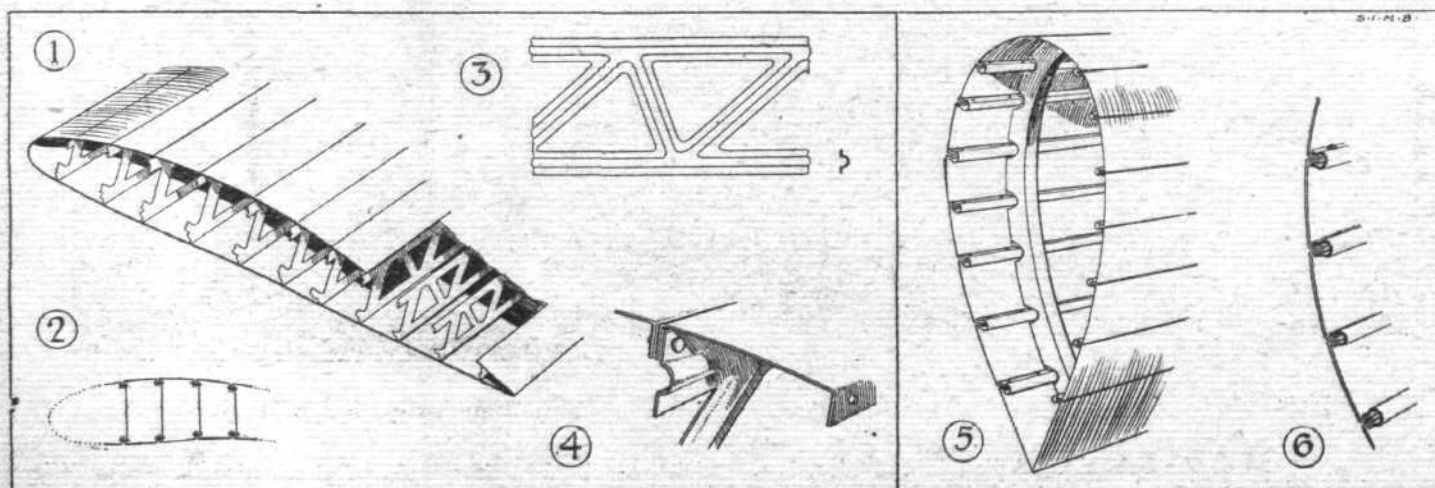
PROBABLY it is not too much to say that the cantilever monoplane, exhibited by the S.I.M.B. firm, which is, we understand, a reorganisation of the firm known previously as Adolphe Bernard, was the most interesting machine at the Paris Aero Show. Whether or not one agrees with

the forms of construction employed, the machine at any rate represented a serious attempt to carry metal construction to its logical conclusion. The problem had, throughout, been attacked purely from a metal point of view, so to speak, and the design was not, like so many others, confined to taking an ordinary aeroplane and substituting, part for part, metal members for the previous wooden ones. It was quite evident that the designer had started with the intention of producing a machine entirely of metal, and had then thought of the machine in such terms as should utilise the material to the best possible advantage.

Very briefly explained, the fundamental principle upon which the designer of the Bernard type C-1 worked was to incorporate to as great extent as possible the outer covering as a stress-resisting part of the structure, and to adapt and simplify the internal framework accordingly. Thus one finds neither spars nor ribs in the ordinary sense of the terms, although members resembling, and performing the functions of, spars are employed in the wing structure. Similarly, in the fuselage the usual girder structure is absent, its place being taken by frames to which are attached the strips that form the covering or planking.

Dealing with the fuselage first, this is in section somewhat like a triangle with its corners rounded off, and its sides slightly curved. In other words, the sections are not unlike those of a sailing vessel, except that there are no hollows, but those occurring where the wings join the body. The frames are of box section Duralumin, and the covering strips, which are of shallow channel section, are riveted to the formers as well as to the U-section covering strips which bind together the flanges of adjoining channels. The fuselage is built up in three sections, the joints between which are covered by circumferential bands. The rear portion carries the tail, while the front portion, which is of heavy gauge Duralumin, serves as a main framework on which all the heavy stresses are concentrated, such as those from the undercarriage, wings, engine and pilot. This portion of the structure is in section somewhat like a cross, the base of which forms the undercarriage "leg," and the arms of which form the wing roots. Horizontally this cross extends forward to carry the engine and aft to support the pilot's seat.

The wing structure is similar in principle to the fuselage, but with the exception that there are no ribs (which would correspond to the fuselage formers), whereas there are a considerable number of spars. The covering is similar to that of the fuselage, i.e., shallow channel section Duralumin strips having the flanges of adjoining channels riveted together, and to the edge of the spars. The latter are stamped from the flat sheet, and have triangular lightening holes stamped in them, leaving top and bottom flanges braced by diagonal ties. In order to stiffen the spars, flanges as well as diagonal ties are fluted or corrugated. It is interesting to note that the spar edges are not placed between the flanges of adjoining channels, but on the side of them. Probably this has been done in order to get the spar edge away from the plane of maximum stress, and so get the latter taken chiefly by the portion of the channels which is bent over at a right angle. We frankly confess that we absolutely fail to guess in what way the last strip of wing covering or planking was got at for riveting. That it was done cannot, of course, be doubted, but it is difficult to see exactly how. It should be mentioned that the channel section strips of the wing covering are parallel, whereas those of the fuselage taper

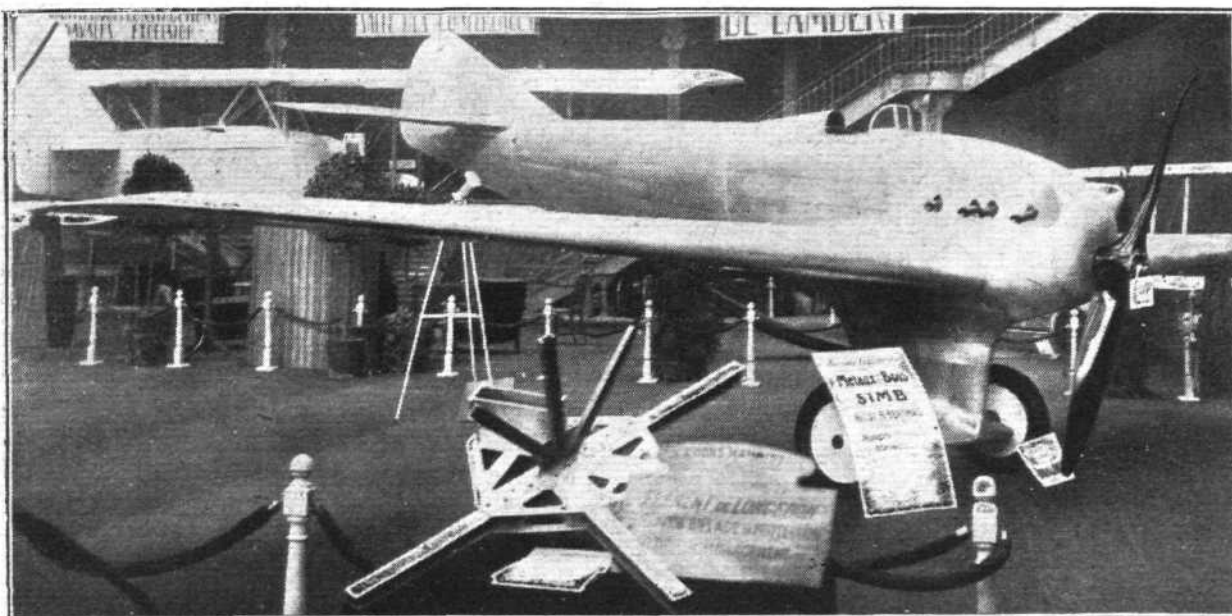


THE S.I.M.B. "FERBOIS": Some constructional details. 1, diagrammatic perspective view of the wing structure. 2, section showing channel strips riveted together and to the spars. 3, elevation of a spar. 4, detail of attachment of planking to spar. 5 and 6, details of the fuselage construction.

from maximum cross section to stern. An exception in the wings is formed by the strips at leading and trailing edges, which are slightly tapered. It is also of interest to note that the planking is of heavy gauge near the leading edge, gradually getting lighter as the trailing edge is approached, thus proportioning to some extent the thickness of the skin to the magnitude of the local stresses.

radiators will be mounted, one on each side of the undercarriage "leg."

Designed by M. J. Hubert, the "Ferbois" type Bernard C-1 is a single-seater chaser with Hispano engine, and its characteristics are as follows:—Length, o.a., 6.6 m. (21 ft. 4 ins.); span, 10.2 m. (33 ft. 5 ins.); wing area, 17.2 sq. m (185 sq. ft.); weight, fully loaded, 1,200 kg.



The S.I.M.B. type Bernard C-1: This cantilever monoplane is built of metal throughout, even to the covering, which is in the form of channel section strips of Duralumin.

The undercarriage is of unusual design, and time alone will show whether the inverted T-shape will stand up to rough landings. As exhibited, the machine had no radiators, and this fact helped in no small measure to give a clean outline. Ultimately we understand that two Lamblin

(2,640 lbs.). Unfortunately no figures are available of the structure weight of the machine. Engine 300 h.p. Hispano; power loading, 8.8 lbs./h.p.; wing loading, 14.3 lbs./sq. ft.; maximum speed (estimated), 315 km. (195 m.p.h.); ceiling, 6,000 m. (19,500 ft.).

THE ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS

COMMITTEE MEETING

A MEETING of the Committee was held on Wednesday, January 24, 1923, when there were present: Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair; Group-Capt. F.W. Bowhill, C.M.G., D.S.O., R.A.F.; Mr. Ernest C. Bucknall; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Lieut.-Col. M. O'Gorman, C.B.; Mr. T. O. M. Sopwith, and the Secretary.

Election of Members.—The following new Members were elected:—

Leonard Logoz Bridgman.
Capt. Leslie George Callingham.
Pilot Officer John Sydney Newall, R.A.F.
Lieut.-Commander Herbert William Shove, D.S.O.
Frederick Sigrist.

Sub-Committees.—Reports from the following Sub-Committees were received and adopted:—

House Committee, Finance Committee, Racing Committee.

F.A.I. Conference, Paris.—Col. O'Gorman and the Secretary attended on behalf of the Royal Aero Club the meeting of the F.A.I. held in Paris, January 3, 1923, at which the following countries were represented:—

America, Belgium, Chili, France, Great Britain, Holland, Italy, Spain, Sweden, Switzerland.

Schneider Race, 1923.—The Regulations for this year's Race, to be held in England, were drawn up. (The Regulations were published in last week's issue.)

Gordon Bennett Balloon Race.—The Race will be held in Belgium on September 23, 1923, and the closing date for entries is March 23, 1923. It was decided to prohibit landing on Russian Territory.

Observatories for Granting Watch Certificates.—The following were appointed:—

Holland	..	Royal Dutch Meteorological Institute.
Belgium	..	Royal Observatory.
France	..	Besancon Observatory.
Switzerland	..	Genoa and Neuchatel Observatories.
England	..	Kew Observatory.
United States	..	United States Naval Observatory.

Speed Records.—It was decided that Speed Records over a given distance must be made without landing.

Gliding Records (Duration).—For duration records for

gliders, the machine must alight within One Kilometre of the starting point.

Triptyque.—It was decided that efforts should be made to establish an International Triptyque, and the form was drafted for submission to the F.A.I. Conference at Gothenburg in August next.

F.A.I. Conference.—The next Conference of the F.A.I. was fixed to take place at Gothenburg on August 8–12, 1923.

Private Pilots' Licences (Class A).—The Committee considered a communication from the Air Ministry on the question of increasing the hours of flying during training, and also the duration of training for aviators' certificates. It was decided to recommend that no alteration be made at present.

Annual General Meeting.—The Annual General Meeting of the Club was fixed for Wednesday, March 28, 1923, at 6 p.m.

Aviator's Certificate.—The following aviator's certificate was granted:—

7939. Ellis Reid, December 19, 1922.

RACING COMMITTEE

A Meeting of the Racing Committee was held on Tuesday, January 16, 1923, when there were present: Maj.-Gen. Sir W. S. Brancker, K.C.B., in the Chair; Commander James Bird; Lieut.-Col. M. O. Darby; Mr. T. O. M. Sopwith, and the Secretary.

Schneider Race.—The Secretary reported the Regulations drawn up by the F.A.I. The Committee considered the question of the locality for the Race, and Commander Bird and the Secretary were instructed to visit certain places and report.

Aerial Derby.—It was decided to hold the Aerial Derby on August Bank Holiday.

The King's Cup.—Letter was read from Sir Frederick Ponsonby intimating that His Majesty the King would present a Cup for this year's Race. It was decided to adhere to the same Regulations as last year, and have the Race during July, on a date to be fixed later.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary.

GLIDING, SOARING AND AIR-SAILING

Those wishing to get in touch with others interested in matters relating to gliding and the construction of gliders are invited to write to the Editor of FLIGHT, who will be pleased to publish such communications on this page, in order to bring together those who would like to co-operate, either in forming gliding clubs or in private collaboration.

FOR several weeks now the two French pilots Bossoutrot and Maneyrol have been playing a game of patience, the one at Etaples and the other at Veauville, near Cherbourg. Bossoutrot is anxious to beat Maneyrol's performance, and Maneyrol means to keep in front, whatever success shall attend the efforts of the Farman pilot. On Wednesday of last week (January 24) Bossoutrot took the air under far from favourable weather conditions. It was bitterly cold, and occasionally snow fell. Nevertheless Bossoutrot stuck to his task, and actually succeeded in remaining up long enough to beat Maneyrol's record of 3 hrs. 21 mins. 7 secs. by 21 mins. Unfortunately, the flight was not officially observed, and thus will not count. It was a fine performance nevertheless, and as official observers are now stationed at Etaples there is little doubt that Bossoutrot will soon be trying again.

BOSSOUTROT was not left to enjoy his unofficial record for long. On Monday of this week Maneyrol took the air on his Peyret glider at 1.15 p.m. and remained aloft for 8 hrs. 6 mins. landing in the dark at 9.21 p.m. Flares were lit to enable him to make a safe landing. At Itford, it will be remembered, Maneyrol also landed after dark, the ground being illuminated by the head lights of motor-cars. Maneyrol's record flight was made at Veauville, the site suggested for the competition to be held this summer. At the time of writing it is not known whether or not the flight was officially observed, but it seems probable that it was.

THE arrangements for the Biskra meeting are now complete, and Commandant Brocard, who is to open the meeting officially, arrived on January 25. At the moment the following pilots are in readiness at Biskra: Thoret, Barbot, Descamps, and Lepetit. Maneyrol was detained at Veauville, but now that he has set up a new record there is little doubt that his Peyret glider will be sent to Biskra with all speed.

UNFORTUNATELY this country will not be represented, as Raynham has decided not to go. The rules for the competition were changed repeatedly, and it was even stated that the competition would not be held at Biskra after all. Then came the flights by Thoret in a Hanriot school machine

(power driven), and it was found that the locality was suitable after all. Probably this influenced the organisers in their decision to hold the meeting, but what with all this uncertainty Raynham did not think it "good enough," and has decided to remain at home. Nor do we blame him.

A GLIDING competition is being held at Sain-Andreasberg in Germany from January 28 to February 6. Several of the German glider pilots are expected to take part, and it is stated that Hentzen will be there with his "Vampyr." It is probable that experiments will also be made with gliders fitted with small engines, and possibly Budig will be present with the machine described in FLIGHT recently.

WE should like to remind our readers that the competition for the Selfridge Prize of 1,000 guineas is now open. The rules were published in our issue of December 7, 1922, but a brief résumé may be helpful.

THE Selfridge Prize will be awarded to the entrant of the machine which first covers a distance of 50 miles, measured in a straight line. Competitors may start from any point in the British Isles, but a map of the district in which it is intended to fly must be sent to the Royal Aero Club seven days before the first attempt, and on this must be marked the approximate starting place and route to be followed. Notification must be given to the official observers, and as far as possible these will be appointed locally. The expense of observers must be borne by the competitor.

THE Royal Aero Club will issue special log sheets, and these must be carried by the pilot in all flights in connection with the competition. On landing, the pilot must fill up the landing certificate on the log sheet. The landing certificate must be signed by the pilot and by two responsible persons present at the time of the landing. If none was present the certificate must be signed by two responsible persons residing in the district. The log sheet must be posted to the R.Ae.C. not later than 48 hours after the landing.

FULL particulars of the competition can be obtained from the Royal Aero Club, 3, Clifford Street, London, W. 1. The entrance fee is £5, and must be sent, with a properly filled up entry form, seven clear days before any flight made for the prize. In the event of the prize not being won this year, Messrs. Selfridge and Co., Ltd., will present 500 guineas to the entrant of the machine which covers the longest distance, provided a minimum distance of not less than 25 miles has been exceeded.

LONDON TERMINAL AERODROME

Monday Evening, January 29, 1923

THE new Aero Union, as the combination of C.M.A. and Grands Express is now called, are having considerable success with their newspaper service between Lympne and Paris. Last week, indeed, there were three days on which this service was run when it was impossible for any machine to leave or enter Croydon. It is a remarkable commentary on the bad communications between London and the aerodrome at Croydon when it is realised that the time occupied for the newspapers to get to Lympne from London is only half an hour more than the time taken from London to Croydon. Taking this into consideration, a recent flight by one of the "Goliaths" from Lympne to Paris in 1 hr. 10 mins. must have meant that the newspapers were transported between London and Paris in record time.

The Instone Air Line have again resumed their service to Brussels, the machines calling there again on their way to and from Cologne.

"Dress Rehearsals" for the Night Service

In preparation for the night-flying experiments which are to be carried out for a month from February 5, several "dress rehearsals" have been held at the aerodrome during the last week. The machine used was a Bristol "Fighter" with a Rolls-Royce "Eagle" engine, and Major Biddlecombe, who is in charge of the night-flying on the English part of the route, has been making flights between here and Lympne to see for himself that all is in working order.

The Daimler Airway have been running consistently on the Manchester route—despite the fact that passengers are not forthcoming in such great numbers as hitherto—and, owing to a prevailing north-west wind in the upper air,

they have been making the journey from Manchester to London in a little over 90 mins. The Daimler Airway is to run a service between London and Manchester and the Trades' Fair at Birmingham, which commences on February 19, and, as the exhibition buildings are adjacent to the aerodrome, passengers will be landed actually in the grounds of the Exhibition, thus saving an appreciable amount of time in the journey from Manchester, even taking into consideration its comparative shortness.

Major Woods Humphreys left for Wiesbaden on Saturday to attend a conference of the International Air Traffic Association which opens there today. I understand that the principal item on the agenda is the question of operating European services in view of the present state of affairs in Germany.

When the members of the Air Conference visit the aerodrome on February 5, they will, in addition to seeing all the latest commercial machines—and, of course, all the Air Ministry "white elephants"—be treated to an exhibition of speed-flying by Mr. Jimmy James on the "Bamel."

"Joy-Rides" Already in Vogue Again

JOY-RIDES are beginning again to be a feature of the week-ends, and on Saturday and Sunday this week-end there were quite a number of passengers carried by the Surrey Flying Service "Avros." In fact, although it is as yet slow work, the success already augurs well for a successful season.

Regarding the accident to the Fokker monoplane recorded in this column last week, the machine was not as badly damaged as was at first thought, and will be flown back to Holland in the course of the next few days.

THE ROYAL AIR FORCE

London Gazette, January 19, 1923

General Duties Branch

Wing Commr. C. T. Maclean, D.S.O., M.C., is placed on half pay, Scale A, from January 19 to February 12, inclusive.

Stores Branch

Flying Offr. H. J. Dann to take rank and precedence as if his appointment as Flying Offr. bore date September 12, 1919, immediately following Flying Offr. E. V. E. Andrewartha (reduction to take effect from December 19, 1922).

London Gazette, January 23, 1923

General Duties Branch

The following Cadets having successfully passed through the R.A.F. (Cadet) College, are granted permanent commissions as Pilot Offrs.; December 20, 1922:—J. S. Newall, R. Lewes, G. H. Randle, F. G. Cator, W. A. Opie, F. S. Harris, R. B. Jordan, R. H. Carter, G. E. Nicholls, F. E. Nuttall, T. D. Berridge, D. F. A. Apthorp, F. F. R. Goldsmid, R. W. G. Lywood, M. J. Fitzmaurice, N. Carter.

The following Flying Offrs. (since promoted) are granted permanent commissions in ranks stated, with effect from dates indicated. *Gazettes* of date indicated in brackets, appointing these officers to short service commissions, are cancelled:—L. M. Iles, A.F.C.; May 18, 1920 (May 18, 1920). G. F. Smylie, D.S.C.; July 16, 1921 (July 26, 1921). H. A. Argles is granted a short service commission as Flying Offr., with effect from, and with seniority of January 12. Flying Offr. S. A. C. Newnham resigns his short service commission; January 24. Observer Offr. S. Barnes (Lieut. R.F.A.) relinquishes his temporary commission on retirement from the Army; January 18. *Gazette* January 9 concerning Pilot Offr. C. M. O. O. Springfield is cancelled.

Memoranda

Maj.-Gen. Sir H. H. Tudor, K.C.B., C.M.G., is granted a temporary commission as an Air Vice-Marshal whilst commanding the Forces in Palestine; September 1, 1922. Lieut. T. St. C. Douglas is transferred to unemployed list; July 4, 1919 (since relinquished) (substituted for *Gazette* October 10, 1919).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified:—*Group Captain*: H. Cooper, D.S.O., B.A., from Headquarters, R.A.F. India, to Headquarters, Iraq Command. 8.1.23.

Squadron Leaders: E. A. B. Rice, M.C., from Air Pilotage School (Cadre) (Inland Area) to command No. 11 Squadron (Inland Area). 15.1.23. R. H. Jones, O.B.E., from No. 5 Flying Training School (Inland Area) to half-pay list. 3.1.23. T. E. B. Howe, A.F.C., from Air Pilotage School (Cadre) (Inland Area) to No. 11 Squadron (Inland Area). 15.1.23. A. E. Jenkins, from Air Pilotage School (Cadre) (Inland Area) to No. 11 Squadron (Inland Area). 15.1.23. H. H. Mallet, from Aeroplane Experimental Establishment (Coastal Area) to Electrical and Wireless School (Inland Area). 29.1.23. H. E. Flavell, from Electrical and Wireless

School (Inland Area) to No. 5 Flying Training School (Inland Area). 1.2.23. R. C. Hardstaff, from No. 47 Squadron (Middle East) to No. 8 Squadron (Iraq Command). 26.12.22. A. E. Gendle, O.B.E., from Headquarters, R.A.F. (Middle East), to Headquarters (Iraq Command) 26.12.22. E. J. D. Routh, from No. 14 Squadron (Palestine Command) to No. 30 Squadron (Iraq Command). 26.12.22. A. G. Taylor, A.F.C., from No. 1 Flying Training School (Inland Area) to No. 2 Squadron (Inland Area). (Supernumerary.) 9.1.23. R. H. Portal, D.S.C., from Royal Navy to R.A.F. Base, Gosport (Coastal Area). On appointment to temporary commission in Royal Air Force on attachment from the Navy. 8.1.23. W. R. Fairbairn, from Aircraft Park (India) to R.A.F. Depot (Inland Area). (Supernumerary.) 21.12.22.

THE LONDON-CONTINENTAL SERVICES FLIGHTS BETWEEN JANUARY 14 AND JANUARY 27, INCLUSIVE

Route (including certain diverted journeys)	No. of flights*	No. of passengers	No. of flights carrying		No. of journeys completed†	Average flying time	Fastest time made by	Type and (in brackets) Number of each type flying
			Mails	Goods				
Croydon-Paris ...	29†	54	11	27	27	h. m. 2 21	Goliath F-HMFU (1hr. 50m.)	B. (1), G. (11), H.P.W.8B. (3).
Paris-Croydon ...	26§	57	8	24	20	3 19	H.P.W.8B G-EBBH (2h. 48m.)	B. (1), D.H. 9 (1), G. (9), H.P.W.8B. (3).
Croydon-Brussels- Cologne	13||	33	7	2	12	4 6	D.H. 34 G-EBBV (3h. 41m.)	D.H. 4 (1), D.H. 18 (1), D.H. 34 (2).
Cologne-Brussels- Croydon	12¶	35	11	4	12	5 1	D.H. 18 G-EAWW (4h. 17m.)	D.H. 4 (1), D.H. 18 (1), D.H. 34 (2).
Croydon-Rotterdam ...	10	12	9	9	9	2 23	Fokker H-NABI (1h. 59m.)	F. (5).
Rotterdam-Croydon ...	10	11	10	10	9	3 12	Fokker H-NABS (3h. 23m.)	F. (8).
Manchester-Croydon- Amsterdam	10**	29	1	3	10	6 52	—	D.H. 34 (3).
Amsterdam-Croydon- Manchester	10††	13	5	3	10	5 41	—	D.H. 34 (3).
Total for two weeks ...	120	244	62	82	109			

* Not including "private" flights.

† Including certain journeys when stops were made *en route*.

‡ Lym.-L.B. 11.

§ L.B.-Lym. 6.

|| Croy.-Brus. 2, Brus.-Col. 4.

¶ Col.-Brus. 3, Brus.-Croy. 1.

** Man.-Croy. 3, Croy.-A'dam. 2.

†† A'dam.-Croy. 2, Croy.-Man. 5.

Av = Avro. B. = Breguet. Br. = Bristol. Bt. = B.A.T. D.H.4. = De Havilland 4, D.H.9. (etc.).
F. = Fokker. Fa. = Farman F.50. G. = Goliath Farman. H.P. = Handley Page. M. = Martinsyde. Sp. = Spad.
Vi. = Vickers Vimy. Vu. = Vickers Vulcan. W. = Westland.

The following is a list of firms running services between London and Paris, Brussels, etc., etc.:—Co. des Grandes Expresses Aériennes; Daimler Hire, Ltd.; Handley Page Transport, Ltd.; Instone Air Line; Koninklijke Luchtvaart Maatschappij; Messageries Aériennes.

Incidental Flying.—During the above period Messrs. Perry, Piercey and Capt. Stocken have been busy testing Avros and D.H. 9's at Croydon for the Aircraft Disposal Co., some being flown to Ireland and Spain.

Dutch Air Service to Cologne.

THE Royal Dutch Air Service is organising a regular air service between Amsterdam, Rotterdam, and Cologne, as the entire railway traffic between Holland and the occupied part of Germany has been discontinued. Machines will leave Amsterdam at 8 in the morning and Rotterdam at 8.45, arriving at Cologne at 10.45, returning from Cologne at 3 o'clock in the afternoon. The service will begin immediately after the receipt of the consent of the military authorities at Cologne.

New Air Line from London to Near East.

AN agreement has been concluded between the British and Czecho-Slovak Governments whereby a daily air service

is to be established this spring between London-Cologne-Prague-Budapest. A British company will be designated for the operation of the line, with the assistance of the Czecho-Slovak Government on the Cologne-Prague-Budapest section.

A Birmingham-London Air Service.

A NEW daily air service, connecting Birmingham with Manchester, London and the Continent, will, we understand, be opened by the Daimler Airway on the 19th of this month. The service is to be inaugurated in connection with the British Industries Fair at Birmingham, and the machines will alight on and depart from the grounds of the Fair. This service will enable foreign visitors to be in Paris or Amsterdam within 3½ hours of leaving the Fair grounds.

ROYAL AERONAUTICAL SOCIETY NOTICES



R.38 Memorial Research Fund.—The Secretary announces the further following donations towards the Royal Aeronautical Society's R.38 Memorial Research Fund:—

Officers of the Staff, British Aviation Mission, Japan, £20; Mrs. Little, £8 18s. 9d.; Officers, R.A.F., Peshawar, £7 15s. 2d.; Lieut.-Comdr. White, U.S.N., £5; E. G. Walker, £2 5s.; further interest on Deposit Account, £9 18s. 4d.; previously announced, Total to date, £1,264 19s. 11d.

R.38 Memorial Prize.—The following entries for the R.38 Memorial Prize, the closing date for which was December 31, have been received by the Council of the Royal Aeronautical Society. Entrants are reminded that their papers, together with the signed declaration required by the regulations, must reach the Secretary not later than March 31:—

Commander F. L. M. Boothby; Capt. Elbridge Colby; A. P. Cole; Wing-Comm. J. N. Fletcher; Commander J. C. Hunsaker, C. P. Burgess, S. Truscott (joint authors); Robert Jones; Major G. H. Scott, Lieut.-Col. V. C. Richmond (joint authors); Norman Meadowcroft; R. H. Upson; Prof. Dr. T. v. Karman; Ing. Rodolfo Verdizio; Dr. Karl Wegener, Dr. Karl Schneider (joint authors).

W. LOCKWOOD MARSH,
Secretary

Institute of Aeronautical Engineers.

A VERY interesting paper was read on January 26 by Mr. W. L. Cowley, of the N.P.L., entitled "The Wind Tunnel Work at the N.P.L." The first part of the paper was devoted to a description of the equipment at the National Physical Laboratory, including the various wind tunnels, balances, etc. The lecturer then gave a short *résumé* of the programme of the work carried out, but as this is confidential until published by the Air Ministry he confined himself to an account of the experiments that have already been mentioned in the reports of the N.P.L. In the matter of aerofoil work, Mr. Cowley referred to the monoplane and biplane tests on R.A.F. 15, and to the investigation by the N.P.L. of the Prandtl aerofoil theory. He also referred to the work on controllability at large angles of incidence and to the allied problems of spinning or "autorotation."

The airscrew programme at the N.P.L. is very extensive, and was dealt with by the lecturer, as was also the use and advantages of the "whirling arm." On the subject of scale effect Mr. Cowley referred to the possibility of using the compressed air tunnel for experiments such that the Reynolds number was the same as that of full-size machines, and he expressed the opinion that there were good reasons to believe that the high-pressure tunnel was the most satisfactory method of studying the complex question of scale effect, and that considerable development might be expected in this direction.

The next paper to be read before the I.A.E. will be entitled "Seaplane Design," the author being Mr. W. O. Manning, who is one of the pioneers of British aircraft designers. The meeting will take place at the Engineers' Club, Coventry Street, at 6.30 p.m.

The Flight Around the World.

PREPARATIONS are rapidly being completed for the flight around the world planned by Capt. Norman Macmillan and Capt. G. H. Malins. The flight is being organised by the Legion of Frontiersmen, and no effort is being spared to make the details as thorough and complete as possible. At present there is considerable speculation regarding the machine to be used for the flight, its make and type having been kept a secret. It may be stated, however, that it has been designed by a very experienced designer, and that although it is of somewhat novel type it is not expected that any unforeseen difficulties will arise in connection with its performance and general handling in the air.

A third partner in the venture still has to be chosen, but Macmillan is taking his time over the choice, realising how important it is to have the right man for the job of assistant pilot, etc.

The route to be followed has not been definitely decided, but in the main it will be that planned by the late Sir Ross Smith, with the exception that Macmillan intends to fly, not across Burma, *via* Mandalay, but down the coast and across the narrow peninsula to Bangkok, and hence following the coast of Siam, Cochin China, and French Indo China up to Hong Kong, Canton and Shanghai. On the homeward "leg" Macmillan intends to break new ground by flying from Newfoundland up to the coast of Greenland, across to Iceland, and hence *via* Faroe Islands to Scotland. The date for the start has not yet been definitely decided upon.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS (London Aero-Models Association)

On Friday last, six new members were elected to the Society. On Friday next, February 2, a General Purposes Committee, meeting will be held.

On Sunday, February 4, at Parliament Hill, an attempt will be made to improve the glider record at present held by C. J. Burchell (44 secs.). Judges will be at the starting point at 11 a.m. prompt.

Mr. C. Bayard Turner has kindly presented the Society with a "Record Cup," for enclosed fuselage gliders.

This must not be confused with the Glider Record Cup, presented by Mr. W. E. Evans, which is for any type of glider record, and therefore in the event of an enclosed fuselage glider breaking the record, it will hold the two Cups.

Mr. M. Levy has kindly promised a prize of half a guinea for the glider record holder for 1923, and will increase same to one guinea if the record is 100 secs. or over.

All interested in model aeronautics, should communicate with the Hon. Sec., A. E. Jones, 48, Narcissus Road, N.W. 6, for full particulars of the Society.

A. E. JONES.
Hon. Sec.

PUBLICATIONS RECEIVED

Aeronautical Research Committee Reports and Memoranda. No. 794. (Ae. 51). *The Aerodynamic Loading of Airships.* By Professor L. Bairstow, C.B.E., F.R.S. September, 1921. London: H. M. Stationery Office, Kingsway, W.C. 2. Price 3½d. post free.

Reports: No. 125, *Aeronautic Instruments, Section I, General Classification of Instruments.* No. 127, *Section III, Aircraft Speed Instruments.* No. 129, *Section V, Power Plant Instruments.* No. 130, *Section VI, Oxygen Instruments.* No. 131, *Section VII, Aerial Navigation and Navigating Instruments.* No. 145, *Internal Stresses in Laminated Construction.* By A. L. Heim, A. C. Knauss and L. Seutter. No. 150, *Pressure Distribution over Thick Aerofoils.* By F. H. Norton and D. L. Bacon. No. 152, *The Aerodynamic Properties of Thick Aerofoils, II.* By F. H. Norton and D. L. Bacon. No. 153, *Controllability and Manœuvrability of Airplanes.* By F. H. Norton and W. G. Brown. No. 154, *A Study of Taking Off and Landing an Airplane.* By T. Carroll. No. 155, *A Study of Airplane Manœuvres, with Special Reference to Angular Velocities.* By H. J. E. Reid. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

Commercial Art. No. 4. January 23, 1923. 37, Drury Lane, W.C. 2. Price 1s. 6d.

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